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Twenty-second session
Geneva, 10 December 1990
Agenda item 3 (b)

DISCUSSIONS OF THE SESSIONAL WORKING GROUP: REVIEW OF THE CURRENT MARKET SITUATION AND OUTLOOK

The following is the text of the presentation made by Mr. V. Marchenko as guest speaker at the Committee on Tungsten at its twenty-second session.

GE.90-53119/8649A

In my presentation I shall attempt, using indirect data, to describe the development trends and characteristic features of the tungsten and molybdenum industry in the USSR over the past 10 years, beginning with 1980 and looking in more detail at the years 1986-1989. The activities of enterprises in the Soviet tungsten industry over this period showed a positive development trend, which was determined by two factors: a steadily growing consumer demand for tungsten concentrates and a desire to reduce the USSR's reliance on imports.

Consumption of tungsten concentrates in the USSR declined by 9.4 per cent compared with 1980 over the nine years, and by 7.8 per cent in 1986-1989.

Production of tungsten concentrates rose by 16.5 per cent over the 1980 level during this period, and by 11.5 per cent in 1986-1989.

The higher rates of production compared to consumption of tungsten concentrates in the USSR during the previous four years made it possible, without lowering State reserves, to cut back imports of tungsten concentrates in 1990 by 28 per cent as compared with the 1985 level, thereby reducing the share of imports in total consumption.

The pattern of consumption of tungsten concentrates has remained stable in the USSR over the past five years, roughly equal amounts being used in hard-alloy production and steelmaking and in the engineering industries.

Conversion in the defence industry has not so far led to any substantial decline in tungsten consumption country-wide, but it did help to stop consumption from rising further in 1988-1990.

In analysing tungsten production and consumption in the Soviet Union, it should be noted that demand has not been matched by domestic output for a long time and that unit capital inputs and costs of production have been high, requiring subsidies from State sources to make up for the phasing-out of capacities and to increase the scale of mining and processing to offset the depletion and impoverishment of the mineral raw-material base. Over the past nine years, while the production of tungsten concentrates rose by 16.5 per cent, wolfram ore mining and processing increased by 1.5 times compared with 1980, the average tungsten trioxide content in the ore fell by 10 per cent and the extraction of tungsten trioxide as a concentrate rose from 67 to 68.5 per cent in absolute percentage terms as a result of improvements in the concentration process. Some 23 million cubic metres of rock (ore plus tunnelling and overburden stripping) were mined in 1989, a 2.5-fold increase over 1980.

At present there are eight enterprises (mining-concentrating combines and mine administrations) engaged in the production of tungsten concentrates in the USSR from seven underground mines and four opencast sites.

Opencast mining has increased its share in total production from 49 to 53 per cent over the past five years, while there has been a corresponding decline in underground ore mining. The tungsten trioxide content in the extracted ores was 0.19 per cent as at 1 January 1990 (0.14 per cent by the opencast method and 0.25 per cent in the case of underground mining).

The main producers of tungsten (scheelite) concentrates in the USSR are the Tyrnyauz tungsten and molybdenum combine (North Caucasus), the Primorsky mining and concentration combine and Lermontov mine administration (both in the Soviet Far East), the Orlovsky and Iultin mining and concentration combines, and the Dzhida tungsten and molybdenum combine - all in the Siberian region (Chita and Buryat provinces, Yakutia) and producers of tungsten concentrates. In the Central Asian region there are the Akchatau mining and concentration combine and the Inqichka mine administration. These enterprises work 16 lode deposits and two placers.

Scheelite concentrates accounted for 71 per cent of all tungsten concentrates produced in 1989 and wolfram concentrates for 29 per cent.

The systems most used in underground mining are level-by-level induced caving (up to 45 per cent), room-and-pillar, for gently sloping veined deposits (up to 30 per cent) and shrinkage stoping (up to 15 per cent). As much as 80 per cent of the ore in underground mines is extracted with self-propelled diesel equipment.

The largest underground mine is the "Molibden" mine at the Tyrnyauz tungsten and molybdenum combine, which is working out both an opencast site and a steep deposit of wolfram and molybdenum ores in a single vertical plane under mountainous conditions at a height of 2,100-3,200 metres above sea level. The mine is equipped with 30 self-propelled loader-conveyors and drilling machines and ten 25-ton underground dump trucks, ensuring a labour productivity per man working underground that is extremely high for the industry (up to 12 cubic metres per man/shift).

Some 1.2 billion roubles were spent on capital construction in the country's tungsten industry over the last decade. More than half (700 million roubles) went into the rebuilding and re-equipment of operating enterprises. A further 130 million roubles were invested in expanding existing enterprises (Tyrnyauz and Dzhida combines). The remainder (400 million roubles) went into the construction of new enterprises. Three enterprises - the Primorsky and Orlovsky mining and concentration combines and the Lermontov mine administration - were completed and brought into service during the period under review. The completion of the Primorsky mining and concentration combine and the commissioning of the Lermontov mine administration provided the greatest benefit. These enterprises work deposits which are relatively small but the richest in tungsten trioxide (from 1 to 2 per cent by content) of any deposits in the country.

Despite the substantial capital investment in the development of the country's tungsten industry during the period under review, production of tungsten concentrates did not increase significantly.

Funds for the re-equipment, rebuilding and expansion of operating enterprises were used mainly to offset the negative effects of a smaller tungsten trioxide content in the saleable ore and lower dressability.

Thus, for example, one of the main reasons for the declining technico-economic performance of the Tyrnyauz combine, the country's main tungsten concentrate producer, over the past few years has been the increasingly rapid working out of the rich and easily dressable ores.

READEX

There has consequently been a 2.7-fold increase (from 1980 to 1990) in the amount of poor wolfram ores mined by the opencast method.

At the Primorsky mining and concentration combine the richest ores were concentrated in the upper part of the deposit, which was worked out by the opencast technique from 1976 to 1988.

A similar situation as regards the quality of the ores processed has also come about at a number of other enterprises.

Under the circumstances, great attention was focused on applying developments in science and technology at these enterprises to increase the amount of ore stripped and prepared, to counteract the declining yield of the ore, study its quality and improve ore-dressing processes.

Virtually all tungsten industry enterprises have undergone re-equipment and rebuilding since 1980 in view of the change in the raw-material base. The re-equipment of opencast mines helped to increase the volume of rock mined dramatically, even with a smaller workforce, through the use of 8-12 and 5 cu.m. excavators, front-end loaders and dump trucks, some of them Euclid and Komatsu trucks, with a load capacity of 110-150 tons, as well as powerful bulldozing equipment and new explosive materials (including hot-poured explosives).

At the Tyrnyauz tungsten and molybdenum combine, a system of working by "dry" filling of the excavated areas in the ore reserves of the opencast site has helped to make the rich ores more accessible and to prevent underground stoping from affecting operations at the opencast mine, which is working out an ore deposit located in the same vertical plane. The Tyrnyauz combine has also introduced selective mining, transportation and processing of a new skarn marble ore, with scheelite enrichment in heavy media.

Tungsten and molybdenum concentrator plants have recently installed pneumo-mechanical and pneumatic flotation machines of 12.5 and 80 cu.m. chamber capacity, and operate 7- and 9- metre autogenous grinding mills.

At the Tyrnyauz combine, the rope-ways tracks for hauling out the ore have been replaced by compensating pulp lines capable of delivering the ground ore from the autogenous mills into the flotation section of the concentrator from a height of 2,000 to 1,250 metres.

Recent research and development work and pilot industrial projects point the way to the introduction, over the new few years, of integrated systems of processing wolfram ores that are difficult to concentrate, combining the production of poor-quality tungsten by the flotation method with further processing to create a saleable product using hydrometallurgy and biotechnology.

A total of 93 deposits of wolfram-containing ores had been explored and found suitable for exploitation in the USSR as at 1 January 1989, 55 being lode deposits and 38 placers. The bulk of the wolfram-containing ores (99.6 per cent) is concentrated in lode deposits.

The greater part of the Soviet Union's explored tungsten reserves consists of wolfram and wolfram-containing ores in lode deposits. Significantly fewer reserves are to be found in the ores of lode deposits where the wolfram is an incidental component. A small proportion of the reserves and mining operations are in wolfram-tin placers.

The effectiveness of prospecting is very high. Annual additions to reserves are two to five times greater than the quantities of wolfram extracted or lost in situ during exploitation.

A distinctive feature of the wolfram-containing ores in the USSR is the low tungsten trioxide content.

The tungsten industry had a supply of explored tungsten trioxide reserves country-wide, as at 1 January 1984, which should last 60 years assuming that output remains stable at the 1990 level in 1991 onwards.

However, the supply of explored and exposed reserves at individual mines and opencast sites varies considerably, from a few years to 30 or 50 years.

New deposits will therefore have to be developed to maintain production, compensate for the phasing-out of capacities and increase tungsten output to meet consumer demand (consumption is expected to increase by 5 to 6 per cent in 1995 over the 1990 level). Half of the country's explored tungsten reserves are concentrated in deposits in Soviet Central Asia (Kazakh Republic) and about 20 per cent in the North Caucasus; the remainder are in deposits in the Soviet Far East and Western Siberia. The best prepared for development is the North Caucasus region. To encourage enterprises to increase output of tungsten concentrates and provide economic incentives to make up for the phasing-out of capacities, the average price of tungsten concentrate in the USSR will be doubled on 1 January 1991, and contract prices along with tax concessions have been authorized where the profit rate is less than 30 per cent of the production cost.

This will help to promote the renovation and maintenance of operating capacity. Yet, even at the new price, one ton of tungsten is still below the prevailing world prices at the unofficial rouble-dollar exchange rate. Under the circumstances, therefore, we think it is worthwhile to attract foreign capital for the construction of mining/concentrating and mining/metallurgical combines, with the investment being offset either by our marketable tungsten or by other goods (including associated materials) in a compensation arrangement between the partners. This would to some extent help to avoid a monopoly on the tungsten market and stabilize demand-output and prices for wolfram-containing products.

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DISCUSSIONS OF THE SESSIONAL WORKING GROUP: REVIEW OF THE CURRENT MARKET SITUATION AND OUTLOOK

The following is the text of the presentation made by Mr. E. Doronkin as guest speaker at the Committee on Tungsten at its twenty-second session.

In my statement I should like to describe the current status and development prospects of the tungsten industry, as represented in the USSR by the Soyuztverdosplav production association.

The Soviet Union has up-to-date facilities for the industrial production of semi-finished and finished tungsten and tungsten-alloy products for most of the mechanical engineering sectors of the economy. The product range includes thousands of items to meet the requirements of such high priority, high-tech industries as electronics, electrical engineering, instrument-making, machine-tool construction and the automobile industry, among many others.

The manufacturing cycle begins with the processing of scheelite and wolframite concentrates and intermediate products. Standard concentrates contain 55 to 65 per cent tungsten trioxide, whereas in intermediate products the content of the main component is as low as 20 per cent. Around 40 per cent of all the tungsten trioxide obtained through hydrometallurgical processing of tungsten ore comes from tungsten-molybdenum concentrates with an initial tungsten content of 35 to 37 per cent and a molybdenum content of 2 to 2.5 per cent.

Up-to-date sorption and extraction technology has been successfully introduced at Soyuztverdosplav plants alongside traditional ore-processing facilities over the past 10 years in order to increase the ability to process low-grade tungsten ore and tungsten-containing waste with a high level of impurities, and to increase productivity by operating processes uninterruptedly, mechanizing and automating processes at all levels, and reducing the impurity content of processed products.

Traditional means of processing tungsten ore use sedimentation processes. They may be divided into the following basic technological categories: four means of treating mined ore (1 - constant-process digestion with sodium hydroxide, chiefly to leach sheelite concentrates, in vertical autoclaves at a temperature of 220° C; 2 - batch digestion with sodium hydroxide to produce tungsten-molybdenum intermediate products, initially in horizontal rotating autoclaves and later in an array of vertical tube autoclaves at a temperature of 225° C; 3 - sintering with calcined soda and sand, for processing sheelite and wolframite concentrates with a high tungsten content, performed in a rotating tube furnace; 4 - fusing concentrates with a high tungsten content in electrical furnaces with graphite electrodes at a temperature of 1,000° C, followed by crushing and hot water leaching) and the intensive method of high-temperature leaching with sodium hydroxide in an autoclave (permitting the use of otherwise uneconomically low-grade ore) to yield sodium tungstate liquor; and the precipitation of tungsten from the liquor with calcium chloride solution, yielding synthetic scheelite which with the addition of hydrochloric acid produces tungstic acid. The acid is dissolved in ammonium hydroxide solution to yield ammonium tungstate, which is evaporated to yield crystals of ammonium paratungstate, and these are then roasted to yield tungsten trioxide.

The new technologies for tungsten-ore processing by means of sorption and extraction use hydrochloric, sulphuric and nitric acids. In essence, the process involves transforming sodium tungstate liquor into ammonium tungstate by first removing the tungsten with a sorbent or extractive agent, followed by desorption (re-extraction) of the tungsten from the sorbent or extractive phase into the ammonium tungstate solution. After each cycle the sorbent or

extractive agent is regenerated for further use. The sorption process takes place in counterflow columns of liquor and ion-exchange resin until the resin is saturated with tungsten. The original liquor is washed out of the saturated resin (with acidified water), then the acidity is washed out (with softened water), after which the tungsten is desorbed from the saturated resin with a solution of ammonium hydroxide to yield ammonium tungstate solution, evaporation of which yields crystals of ammonium paratungstate. Like the sorption process, the washing of the resin takes place in counterflow ion-exchange columns. After desorption of the tungsten the resin is regenerated, recharged and recycled for further use. Before sorption (and also before extraction) silicon, phosphorus, arsenic and molybdenum impurities are removed from the sodium tungstate liquor. In terms of the mechanics of their operation, the sorption and extractive processes can be regarded as identical. The sorption process extends over several hours, whereas the extraction process is almost instantaneous but with uninterrupted processing, this advantage is cancelled out. In terms of environmental impact, pleasant and safe working conditions and opportunities for automation, the sorption process offers advantages over extraction.

The high quality of the product obtained using these modern sorption and extraction processes is attested to by analyses performed by leading world manufacturers of hard metals - Sandvik Coromant of Sweden and Hartel of Germany - and by a string of contracts with foreign companies for the supply of ammonium paratungstate and tungsten trioxide.

Considerable attention is paid to the processing of tungsten-containing waste. This is generally accomplished by melting with sodium nitrate, then leaching the melt with water. Another promising technique for processing waste is zinc-based oxidation-reduction. Dust waste from hard metal tool-grinding is also being reprocessed, but the technology needs further work.

The products of hydrometallurgical tungsten-ore processing are used for powder metallurgy, the next technological step in tungsten production. The main process used to manufacture powders is reduction with hydrogen, either of the original ammonium salts themselves or of the product of roasting them (tungsten trioxide), in a single stage or two stages, predominantly in multi-muffle multi-zone pusher furnaces at temperatures of 700 to 1,200° C. Furnaces with rotating muffles are used in some cases to produce tungsten dioxide and to roast the salts. Altogether the industry produces 30 grades of tungsten powder ranging in particle size from 1 to 30 micrometres, at varying degrees of chemical purity and differing in shape, particle morphology, specific surface, compactibility, fusibility and so forth. In recent years six grades of tungsten powder with specified particle-size distributions have gone into production; they are used to make hard alloys and materials with precision porosity characteristics (highly regular porosity, or open pores of uniform dimensions with no closed pores). The manufacture of ultrafine tungsten powders in high-energy flows has been introduced on an industrial scale. Average particle size (FSSS) is 0.2 to 0.4 micrometres, specific surface area is 5 to 10 m^2/g and oxygen content is less than 3 wt%. The high chemical reactivity of these powders allows sintering temperatures to be reduced by 300 to 500° C and carburizing temperatures to be reduced by 100 to 200° C. Such powders are suitable for the manufacture of composite, structural and tool materials. Hard metals prepared from such powders have a superfine grain structure and are two to four times more hard-wearing.

The tungsten powders produced are used in the manufacture of three basic categories of hard metal: tungsten-cobalt, titanium-tungsten and titanium-tantalum-tungsten, which are used in the manufacture of a wide range of hard metal products for metalworking and mining applications, including indexable bits with wear-resistant coatings.

The traditional technologies for manufacturing hard metal products are: carburizing tungsten in constant-process carbon tube resistance furnaces; crushing and grinding the tungsten carbide in crushers and wet mills, introducing the binder directly during milling to produce a composite; drying the composite in steam condensers which can be of two types and sometimes incorporate mixing devices, or pulverizing it in vacuum condensers to yield a granulated composite; forming the composite in one- or two-sided automatic cam-driven presses, sometimes robot assisted; sintering the hard metal products in resistance furnaces with graphite tube heating elements, molybdenum heating elements and Alundum muffles, or in charging induction vacuum furnaces; and the machining and finishing of the product items to the requisite shape.

Alongside these traditional technologies, scientific advances are being widely adopted in hard metal manufacture and the industry is undergoing comprehensive retooling with a view to adding spraying capability to composite-drying equipment, equipping electrical charging furnaces for computer-controlled one-stage vacuum or hydrogen-atmosphere sintering, adding automatic presses and robot spreaders to the extension sections and automatic robot-assisted finishing tools to the finishing sections.

A substantial proportion of the commercial output of the tungsten industry consists of refractory metals made of pure tungsten and tungsten/rare-earth alloys. The tungsten industry currently produces up to 85 per cent of the tungsten wire used in the USSR, plus sintered bars, powders, and practically all the rolled products for applications in the electronics, electrical engineering, rocket technology, atomic power generation and defence sectors of industry. Tungsten and tungsten-alloy products are made mainly with powder metallurgy techniques. The traditional method of extension, presintering and sintering (fusing) is used to produce rods in 11 x 11 mm, 14 x 14 mm, 24 x 32 mm and other sizes. Rod shapes and manufacturing techniques vary according to intended use (alloying with special steels or manufacture of tungsten products). For flat rolled products, tungsten rod is hammer forged to a thickness of 6 to 8 mm at a temperature of 1,500 to 1,550° C in hydrogen environment. Flat billets are cut to size (100 to 120 mm) and rolled at 1,550 to 1,300° C to a thickness of 0.8 to 1.0 mm, then "pack rolled" to 0.3 mm. Further rolling is performed without heating or at temperatures of 400 to 600° C. Production of tungsten strip and foil involves a series of in-process anneals. Rolled tungsten is produced in the following forms: strips 3.0 to 0.1 mm thick, 20 to 100 mm wide, and up to 400 mm long; foil 0.09 to 0.02 mm thick, up to 40 mm wide and 100 to 400 mm long. Rolled tungsten can be stamped or sheared into X-ray anode blanks with a pitch angle of 15 to 17° at diameters of 100 x 4.5, 100 x 3.5 and 55 x 6.5 mm (rotating anodes); fixed rectangular anodes in sizes of 2 x 46 x 10, 1 x 8 x 3, 1.5 x 8 x 3, 2.2 x 20 x 12, 2 x 30 x 19 and 2 x 46 x 14 mm; and dish anodes with apertures spaced at 120° angles in diameters of 33 x 0.7, 38 x 1 and 38 x 0.7 mm. It can also be used for

circular targets for X-ray tubes in diameters of up to 30 mm and up to 2 mm thick; and evaporation boats 120 mm long, 24 mm wide, 4 mm deep with 0.6 mm walls. For round bar, tungsten rods are heated and worked in rotary or radial swagers in a hydrogen environment, at 1,550 to 1,300° C to diameters of 2.5 to 3 mm. Further drawing is done on chain drawbenches to a diameter of 1.4 mm, then on Norton or MB 3000 drawbenches to 0.6 to 0.8 mm while the material is heated to 800 to 1,200° C, then on medium- and fine-gauge drawbenches to a diameter of 12.5 micrometres. At diameters below 0.4 mm the wire is drawn through diamond dies. Rotary-swaged and diecast tungsten rods are manufactured in diameters of 3 to 18 mm and lengths of 200 to 1,000 mm. The technology of tungsten deposition from the gaseous phase has been successfully adopted, allowing blanks to be manufactured in a variety of shapes for items functioning in high vacuum. The industry is introducing radically new technological processes for the manufacture of deformed tungsten semi-manufactures, including one-pass reduction of skew-rolled tungsten from a 30 mm square cross section to a diameter of 7 mm and of tungsten rod to 5 mm diameter wire stock; rolling with four-sided reduction in three- and eight-die machines, which results in an equi-axial structure and improves the wire quality; rolling 12.7 x 12.7 mm blanks into 6 - 7 mm rods of various cross section and 9 mm diameter rods into wire feedstock at diameters of 5 and 2.75 mm; hot stamping of evaporation boats for use in sputtering optics and micro-circuits; and a new process for the manufacture of improved-durability tungsten heating elements by means of powder metallurgy.

The tungsten industry is a dynamically growing sector, constantly updating its range of high-quality products. This is significantly facilitated by the existence within the association of a specialized scientific research institute on hard and refractory metals, and a special office whose purpose is to establish and maintain contacts with consumers in order to ensure optimum use of its output and maximum satisfaction of consumer demand. The industry spends between 20 and 25 million roubles on research every year.

In conclusion, I wish to express my gratitude for this opportunity to address such an authoritative international gathering of representatives of the tungsten industry; in view of the far-reaching changes that have taken place in the world arena, I hope to establish new, mutually advantageous relations with my foreign colleagues, including economic and scientific collaboration.

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DRAFT REPORT OF THE COMMITTEE ON TUNGSTEN ON ITS TWENTY-SECOND SESSION

Held at the Palais des Nations, Geneva,
from 10 to .. December 1990

Rapporteur: Mr. Y. ERSHOV (USSR)

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INTRODUCTION

1. The twenty-second session of the Committee on Tungsten was held at the Palais des Nations, Geneva, from 10 to 14 December 1990. In the course of its session, the Committee held .. plenary meetings.

2. The Sessional Working Group of the Committee met from 10 to .. December and held .. meetings.

Opening statement

3. In his introductory statement, the Deputy to the Secretary-General of UNCTAD and Director of the Commodities Division said that the role of the Committee as a forum for consultations between producers and consumers was now even more important in the face of further weakening of the tungsten market. Stabilization of supply and demand had by and large remained an elusive objective. Since the Committee had last met, tungsten prices had continued to slide further from their then existing low levels. This situation had been accompanied by a continued over-abundant supply of tungsten, with shipments of concentrates and intermediate products increasing by over 50 per cent between 1986 and 1989. The historical low prices and over-abundant supply continued to affect many countries members of the Committee in the form of mine shutdowns and/or reduced domestic processing plant capacities. In view of the Committee's role he stressed the need for better tungsten statistics. To this end the sustained support of member governments was necessary. The secretariat would also welcome suggestions for strengthening the participation of industry advisers in the work of the Committee, especially in the area of research and development. Referring to the possibility of the Committee being designated as an ICB for the purpose of financing by the Second Account of the Common Fund, he informed the Committee that the Executive Board of the Common Fund would consider this matter further only if the Committee took a formal decision requesting such designation.

Chapter I

DISCUSSIONS OF THE SESSIONAL WORKING GROUP

(Agenda item 3)

(a) Examination of statistics provided by the secretariat

4. The main working document under this agenda item (TD/B/C.1/TUNGSTEN/STAT/L.57) was introduced by the representative of the UNCTAD secretariat. He advocated caution regarding the estimates for 1990, which were based on preliminary and incomplete data and might therefore be subject to substantial revision. He invited delegates to provide, if they had not already done so, national estimates for 1990 and forecasts for 1991 so as to provide the Committee with a revised and updated document. Accurate figures were indispensable for the Committee to assess the market situation and arrive at a short-term market outlook in line with the terms of reference of the Sessional Working Group. He also invited the Committee to comment on the secretariat estimates and to provide suggestions for improving them as necessary.

5. The representatives of Australia, Portugal and the United States of America commented on the quality of the secretariat's estimates. Corrections of some figures were made. There was concern that the statistics of some important consuming and producing countries were still based on estimates. This made it difficult to derive an accurate picture of the tungsten market. It was hoped that with the on-going economic reforms in eastern Europe, some essential data would become available to enable the secretariat to improve market transparency.

6. The representative of China indicated that China was a net exporter of tungsten. Most of its production, however, was geared to meeting domestic consumption. China's domestic production and consumption thus had little bearing on the international market. According to present policies, China published no production or consumption statistics. Aware of its responsibility, China had made available the statistics concerning tungsten exports based on its customs sources. With these statistics, he considered that his delegation had done its share in contributing to the transparency of the international market.

7. The representative of the United States of America referred to the six-week rule agreed by the Committee at a previous session regarding the timely distribution of documents to delegations. He noted that although he had received all other documents on time, the one on tungsten statistics had not been made available within the time-limit, making a full review of the statistics difficult. He also noted that most data was estimated and hoped that improvements in data could be made.

8. The representative of Portugal expressed regret that there were many references to "estimated" data in the document Tungsten Statistics, even for data pertaining to past years. This situation was contrary to the transparency required for smooth market adjustments.

(b) Review of the current market situation or/outlook

9. In introducing the document on market review (TD/B/C.1/TUNGSTEN/84), the representative of UNCTAD stressed the weak tungsten prices, the oversupply situation, the continued competition among suppliers of concentrates and intermediate products, and the large stock of tungsten materials and excess mine capacities overhanging the tungsten market. He also highlighted the damage caused by oversupply and unrestrained competition in the market. This had driven prices down. In this regard, he identified three aspects, namely: the economic and social losses caused by mine shutdowns in many producing countries; the decreased earnings in any attempt to sell more tungsten in an already-saturated market; and the depletion of mineral resources. As regards the outlook, he indicated that there were uncertainties in the market. The oversupply of materials would continue to exert its downward pressure on prices at least for some time and shipments of intermediate materials would continue to play an important role in the supply of tungsten.

10. In his statement, the representative of China gave an account of the efforts made by the Government to stabilize tungsten price and improve the tungsten market. Following an initial improvement at the beginning of 1987 and relative stabilization in July 1989, the tungsten market had again begun deteriorating since August 1989, with the tungsten price registering a steady unabated decline. In his view, the underlying cause was the growing imbalance in supply and demand. The principal contributing factors, however, were not those associated with the increase in the world tungsten production but rather effects of stagnation or steady decline in the domestic demand of the major consumers.

11. He said that since 1989 there had been a decline in economic growth in the major industrialized countries. The sluggish situation in the automobile, steel, machine-building and construction industries of the major tungsten-consuming countries, new technological developments, increased recovery of scrap tungsten and the growth of substitutes had all contributed to a steady drop in tungsten demand in those countries. On the supply side, the closure of a great many tungsten mines in the West during the 1980s, particularly since 1985, had resulted in a sharp fall in their tungsten production. As far as the situation in China was concerned, the production of tungsten ores in 1989 and 1990 had dropped rather than increased compared with the two previous years. The alleged increase in the world's tungsten production was simply not true and the report of an increase in China's production was even more at variance with the facts.

12. He added that his Government had a great interest in market stability. China had borne the brunt of the successive falls in tungsten prices and his country had incurred losses. For many years, the Chinese Government had sought ways and means to improve the tungsten market and to stabilize prices. China was ready to work with other countries in the common interest of producers. At the fifth session of governmental representatives of tungsten producing and exporting countries, the Chinese delegation had made suggestions on stabilizing tungsten price and improving the tungsten market. Various participants at the meeting had agreed after discussions to adopt a mechanism of regular consultations among the tungsten exporting and producing countries with the aim of achieving the price level of $US 69-72 per m.t.u for wolframite. At the sixth session in Sydney (Australia) in October 1989, the participants reached agreement on price levels to be attained: $US 74-77 per m.t.u for scheelites; $US 95 per m.t.u for APT; and $US 10.37 to 10.57 per kg for ferro-tungsten. China had also signed the Orderly Marketing Arrangement with the United States and had equally undertaken a programme of price increases with the EEC on the exports of tungsten and tungsten products. It had also reduced tungsten ores production and tightened licence controls. In 1990, China was exercising further restriction on its exports and was expected to make more cutbacks. These measures testified to the efforts to improve the tungsten market. However, joint efforts of producers and consumers alike were necessary, not just that of a few countries. A fundamental solution to the problem lay in appropriate actions by the

Committee on Tungsten towards an agreement among the producers and consumers on measures to stabilize the tungsten market. Making appeals to a few countries to take action while eschewing international measures could not engender an improved or stable market. Moreover, such an approach would be unacceptable to his delegation.

13. The representative of the United States of America stated that total United States tungsten demand in 1990 was expected to reach 18.7 million pounds, approximately 19 per cent less than in 1989. Although demand in the first half of 1990 had remained constant, demand in the second half of 1990 had begun to falter with the general decline in the overall economy, especially in the automotive sector. National production of ammonium paratungstate (APT) in 1990 was expected to decrease significantly over the level of 1989, by approximately 14 per cent, to 14.8 million pounds. Despite this drop in production, United States consumption of intermediate products remained essentially unchanged from 1989. Capacity utilization rates in the APT sector had declined commensurate with the decrease in APT production, to approximately 57 per cent in 1990, compared with rates of 68 and 71 per cent in 1989 and 1988, respectively. As regards ores and concentrates, the United States rates had continued a downward trend from the levels of the early 1980s. The steep decline in the prices for these products during 1990 had caused the two operating United States mines to produce only intermittently. Several United States mines remained inactive because of declining prices and the surge in concentrate imports since 1987.

14. Net imports continued to represent approximately three quarters of apparent United States tungsten consumption. The People's Republic of China remained the largest supplier to the United States market, despite the Orderly Market Agreement (OMA) established by the United States and China. The current OMA would remain in effect for the first nine months of 1991, lending some stability to the level of APT and tungstic acid imports, but after the OMA's scheduled expiration, the situation was unclear.

15. Regarding the United States Government tungsten stockpile, during the first nine months of 1990 there were no sales of either stockpile-grade or non-stockpile-grade materials. Possibly in future small quantities of non-stockpile-grade ore and concentrate could be released in support of the ferro-alloy upgrading programme. Any release of stockpile-grade ore and concentrate was unlikely since that goal had been increased by 40 per cent, and it now exceeded inventories.

16. The tungsten outlook for 1991 was generally pessimistic. Decreased demand and production, and little relief from the import levels of 1990 could be expected. Demand for tungsten in the United States was expected to decrease by 9 per cent in 1991, to approximately 17.0 million pounds. This decrease reflected expectations of lower overall economic growth for the national economy and the possibility of a recession. The Persian Gulf crisis could have either positive or negative impacts on demand in 1991. Higher oil prices would encourage increased oil drilling activity and thus increase demand for tungsten. However, the slowdown in demand by the transportation sector would likely be exacerbated by higher oil prices.

17. Beyond 1991, increased production of ores and concentrates in the United States was unlikely, assuming prices for these materials remained at current levels or even increased slightly in real terms. The outlook for the production of intermediate tungsten products would depend upon the situation prevailing after the expiration of the current OMA as well as on the level of imports. Overall tungsten consumption was expected to return to the levels of 1988 and 1989. Technical changes in major end-use sectors for tungsten, especially in cutting tools, would mean reduced tungsten consumption. Military applications for tungsten could assume a greater role in demand.

18. The representative of Germany said that the German economy had been expanding steadily for more than eight years. The 1989 GNP in the western part of Germany had grown by 4 per cent in real terms and a similar result was to be expected for 1990. Despite current economic difficulties in the eastern part, an economic upswing was likely in the near future. Inflation had been running at 3.5 per cent and was now being pushed up by price effects stemming from the current Persian Gulf crisis. Modernization and restructuring of the economy in eastern Germany and its infrastructure would create an enormous demand. With regard to tungsten, statistics for a united Germany were still not available. In the western part, however, the consumption of tungsten was nearly as high as the previous year.

19. Referring to the current situation in the tungsten sector, he expressed the hope that the tungsten market would become more transparent. He also drew attention to the fact that the tungsten industry appeared to be losing interest in participating in the meetings of the Committee on Tungsten. In this connection, he called on participants to help make meetings more

attractive to companies in the tungsten industry. He concluded that participation of industry representatives in a producer/consumer forum was necessary for a fruitful exchange in the Committee on Tungsten.

20. The representative of Australia observed that the situation in the world tungsten market had clearly worsened. Despite strong economic growth and improved demand for tungsten, prices had fallen, contrary to the experience for other mineral products. Of particular concern was the poor response of demand to the substantial reduction in real prices. Therefore, he thought that it was highly appropriate to review research and development programmes promoting new applications for tungsten. Turning to tungsten production in Australia, he said that output was likely to fall to around 350 metric tons in 1991 compared to 940 and 1,989 metric tons in 1990 and 1989, respectively. In fact, 1991 production was expected to be only one-tenth of the 1985 output of 3,558 metric tons. The King Island scheelite mine in Tasmania had just been closed down; at present only one Australian mine continued production. The low price of intermediate tungsten products - implying zero processing costs - had depressed concentrate prices to the point where the number of operating mines in the world had fallen from 128 in 1980 to 40 in 1989. He further stated that the principal problem facing the world tungsten market was not only a lack of transparency but also a massive over-supply. He noted that although China had been exhorted to control its production and exports, regrettably this objective had not been achieved. Nevertheless, problems confronting China in regulating production were appreciated. Finally, he said that unless the supply of low-priced intermediate products was controlled, the outlook for tungsten would remain gloomy for many years.

21. The representative of France stated that following the dynamic trends of 1988, the economic performance of her country had remained strong in 1989, achieving a growth rate of 3.7 per cent. The level of economic growth of France was practically identical to the average for its European economic partners, and nearer to Germany's growth of 4 per cent. However, previous growth performance, estimated at 2.6 per cent for the whole of 1990, was unlikely to continue. The principal driving force for economic growth in 1989 as in the preceding year was capital investment by enterprises and the export sector.

22. The strong performance of the French economy had sustained a strong market for tungsten products in 1989. However, since the latter part of 1990, there had a been a slowdown of demand which would continue in 1991. Production of tungsten in 1989 reached 700 metric tons. There were two main reasons for the fall: the effects of stock drawdowns and the decrease of demand in the armament sector. Consumption in 1989 was probably 400 metric tons for tungsten carbide and 200 metric tons for primary tungsten powder. The supply of ammonium paratungstate, now coming mainly from China, was estimated to reach 590 metric tons in 1990 compared with 933 metric tons in 1989. Regarding ferro-tungsten, total imports reached 600 metric tons for 1989 and 182 metric tons for the first six months of 1990.

23. In conclusion, she said that the market situation in France was characterized by a cyclical slowdown. She noted that besides the fall in inventory levels, there was a real decline in tungsten consumption in its traditional applications, largely due to scrap recycling and use of protective tool coatings. It appeared important to support efforts within a wider framework than that of the individual enterprise, with a view to undertaking research and development for new applications of tungsten.

24. The representative of Portugal said that in his country tungsten mining remained very depressed with only one mine open. Portuguese tungsten production in 1989 amounted to 2,296 metric tons of concentrates with a tungsten metal content of 1,376 metric tons. This was 5 metric tons less than in 1988. It was expected that the 1990 output would be very close to the 1989 figure. He noted that before 1986, eight tungsten mines were in operation in Portugal. Due to the crash of the tungsten market, seven of these mines were placed on a care and maintenance programme funded by the Portuguese State. The remaining four mines had some potential, but required further geological evaluation before making investment decisions on reopening them some time in the future. At current prices, three of the mines under the maintenance programme would not be able to re-open. The Panasqueira mine, still in operation, had recently been acquired by Minorco. The new owners had a large investment programme under way, which was designed essentially to reduce production costs through increased productivity. In the foreseeable future it would remain the only producing mine in Portugal and in the EEC.

25. Despite strong economic growth in the last four years, the downstream tungsten industry in Portugal was in no better shape than the mining sector. All production of intermediate products, including ferro-tungsten, had ceased. Unlike past crises and despite a growing world demand, tungsten market prices had remained stubbornly low. This situation was worsened by the widening gap between maximum and minimum prices and the difference between concentrate prices and APT which continued declining during 1990. He thought that this situation was probably a consequence of some unkept promises of some producing countries. Whatever the real causes, protectionist attitudes would be growing in the near future, he observed; these developments were not in the long-term best interest of either producers or consumers. Portugal had supported the last European Commission decision to change from provisional to definitive import duties applied to tungsten concentrates.

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DRAFT REPORT OF THE COMMITTEE ON TUNGSTEN ON ITS TWENTY-SECOND SESSION

Held at the Palais des Nations, Geneva,
from 10 to .. December 1990

Rapporteur: Mr. R. ERSHOV (USSR)

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Chapter I

DISCUSSIONS OF THE SESSIONAL WORKING GROUP

(Agenda item 3) (Continued)

(a) Examination of statistics provided by the secretariat

26. Referring to the estimated data, the representative of the United States noted that there were numerous estimates. The secretariat's suggestion to request Committee members to provide historical data for the revision of earlier years was appropriate, as it would enable the Committee to obtain a clearer picture.

27. In presenting document TD/B/C.1/TUNGSTEN/85, the UNCTAD secretariat observed that there had been a low response to the secretariat's request for information to complete the list of the different definitions and methodologies used in major tungsten-producing countries, as requested by the Committee. Only two replies had been received at the time the document was prepared, namely from China and Spain. However, the reply of Spain provided only comments on the definition of methodology used by the United States Bureau of Mines to derive mine capacities. Another two countries had transmitted their replies during the course of the session and they would be annexed to the report. He hoped that other members of the Committee could also furnish information so as to enable the secretariat to proceed with the completion of the list.

28. The representative of the Republic of Korea said that the Korean tungsten industry had suffered severely from the long-depressed international tungsten price and continuing unstable world tungsten market. During the past decade all of the smaller mines in Korea which once produced tungsten either primarily or as a by-product had been forced to shut down. At present, only one big scheelite mine was still in operation, but at a reduced capacity. For 1990, production was estimated to be below 1,300 metric tons tungsten content, about 20 per cent less than in 1989. A further reduction in production seemed inevitable in the years to come unless there was a considerable improvement in the price of tungsten. With regard to consumption, he informed the Committee that all ores produced in Korea were now being consumed locally for conversion into downstream products. The total demand for ores and concentrates, currently at around 2,000 metric tons tungsten content, was expected to remain

constant, or to increase marginally. He also noted that owing to the reduction in tungsten production and despite sufficient mining and production capacities, his country was no longer a net tungsten ore exporter, but had become a net tungsten importing country. Referring to the statement by the People's Republic of China, he said that his country was encouraged by the Chinese efforts to stabilize tungsten prices and to improve the world tungsten market. He concluded by stating that China, the largest producer and exporter of tungsten, could play an important role in the stabilization and improvement of the world tungsten price.

29. The representative of the International Tungsten Industry Association (ITIA) said that the best guide to what was happening in the tungsten market was price. He noted that at the last meeting of the Committee, the Metal Bulletin wolframite and scheelite prices had stood at $US 44 to 60 and 56 to 72 per m.t.u., respectively. The corresponding prices at present were respectively $US 37 to 49 and 52 to 71 per m.t.u. The ammonium paratungstate (APT) price was currently also down. The ferro-tungsten price per kilogramme had climbed nearly $US 1 by the end of August 1990 but then began to decline again. However, in both 1988 and 1989, consumption of tungsten was healthy owing to a revival in industrial activity and admittedly a certain amount of purchasing for stocks. The market remained over-supplied and additional mines were closed down. He indicated that if tungsten prices had not risen when the economic climate was previously sound, there would appear to be little likelihood of higher prices now, if present patterns of supply and pricing continued. He welcomed China's recent decision to publish its export statistics for intermediate products and concentrates. With regard to substitution and recycling, he stated that these were inevitable, although at current prices, substitution was not a particular problem. Recycling had been increasing. He also noted the abandonment of barter trade by the USSR and the change of payment to convertible currency as of the end of 1990, as well as anti-dumping cases implemented or contemplated in the United States of America and EEC.

30. The representative of Sweden said that his country was a consumer and played an important role on the market. At present there were three tungsten consumers in Sweden: a steel company, Kloster Speedsteel, and two cemented carbide companies: Sandvik Coromant and Seco Tools. Over two thirds of Swedish tungsten consumption was used in the cemented carbide sector. Both cemented carbide and steel industries were highly dependent on exports. He

also informed the Committee that consumption of ores and concentrates in Sweden had amounted to about 320 metric tons in 1989, a level that was likely to remain fairly stable in 1990. Concerning the total consumption of tungsten, during the 1980s, it had shifted considerably from primary products to intermediate products, mainly APT. Taken together, the consumption of ores, concentrates and intermediate products in 1989 had reached a level of about 2,000 metric tons. For 1990, total consumption had been predicted to remain at the same level and no major change had been forecast for 1991. He also noted that due to the closure of Sweden's only tungsten mine in 1989, Swedish industries were now entirely dependent on imports for tungsten ores and concentrates.

31. The representative of the USSR said that market developments were influenced primarily by general economic factors: deceleration of the rate of economic growth and decrease of production in a number of industries consuming tungsten products. The specific character of the market, determined by relative narrowness, was the immediate response of prices to the changes in supply and demand in the direct sphere of foreign trade. In his view, the outlook for consumption of tungsten and the possibilities to increase its utilization, were now more favourable. The decrease of consumption in the defence sector would be followed by increased utilization in the civil sector, stimulated by the current level of world prices.

32. He noted that the trend in the world trade of tungsten products was a decreasing share of raw materials and an increasing share of intermediate products, which accounted now for one third of world exports. The same tendency was observed on the markets of other metal raw materials and semi-finished products. It was necessary to note the increase in 1990, as well as earlier, of protectionist tendencies in the world trade of tungsten.

33. Referring to the prospects for the world tungsten market, it would be necessary to take into account that the latest prognosis of economic development had been again reconsidered; they were now more pessimistic, which would not have a positive effect on the tungsten market. At the same time the development of the situation in the Persian Gulf zone could influence to some extent the tungsten market. Demand for tungsten-containing materials might rise if there was any delay of a peaceful solution.

34. The consumption of tungsten concentrate in the USSR had stabilized. Some 57 to 58 per cent of total consumption of concentrates was accounted for by hard alloy production while the rest was consumed in special steel

production. Being an importer of tungsten, the USSR in 1990 for the first time entered the world tungsten market as an exporter of tungsten products. In 1990 the Soviet Union exported the first 250 tons of tungsten powders. The Soviet tungsten industry has very favourable prerequisites for further development, with proven reserves of tungsten trioxide for a period of 60 years of production at current levels. In order to increase the production of tungsten concentrate, the USSR tungsten industry was prepared to attract foreign capital on the basis of investment compensation either in terms of tungsten products or other goods, in an agreement between partners.

35. The tungsten industry in the USSR was also influenced by the policy of perestroika. The centrally planned economic model was being gradually replaced by the regulated market-economy model. Structural changes in the Soviet Union economy had provided for the transfer of the centres of regulation and administration of industry and agriculture to the regions and Republics of the USSR. Likewise, certain changes were taking place in the organization of statistical work. He believed that the appropriate tungsten statistics would be available very soon.

36. The USSR also stressed the growing importance of environmental aspects of tungsten production and consumption, including sustainable utilization of mineral resources and recycling. The recent Trade and Development Board decision 384 (XXXVII) was highly relevant to the work of the Committee on Tungsten, particularly operative paragraph 1 of this decision, which states that the objective of sustainable development should be incorporated into all areas of UNCTAD's work at the intergovernmental level and that the respective committees at their forthcoming sessions should consider activities in relation to sustainable development in the context of their work programme. In this connection, he proposed that the Committee on Tungsten should pay due attention in its future work to various aspects of environmental sustainability of the world tungsten economy.

37. The representative of Japan drew attention to the downward trend of the wolframite price in the 1980s. In his opinion the causes of depressed prices were multiple although the most notable seemed to be an increasing supply of intermediate products at low prices, such as ferro-tungsten and ammonium paratungstate. Intermediate products had also a strong impact on the Japanese market. The 1989 imports of ores were 17 per cent below the 1988 level of 2,316 tons. However, mine production increased by about 12 per cent to 489 metric tons (gross base) in 1989. Regarding demand, despite lower

consumption of tungsten ores, domestic consumption of primary metal had increased by 12 per cent in 1989. This development reflected the effectiveness of measures taken to promote domestic demand. Especially notable was the remarkable rise in the consumption of primary metal used for cemented carbide tools, which reached 4,009 metric tons, an increase of 37 per cent over 1988.

38. Referring to recycling of tungsten, he informed the Committee that research and development under way in Japan was aimed at finding an economical method of recycling cemented carbide alloy scrap and developing recycled products with multiple uses. However, since no statistics on recycling were available, he could not give a clear picture on recyling in Japan, but he admitted that the prospect to increase recycling of tungsten was rather dim at present, given the depressed price of tungsten and low grade of recycled metal which is used as a by-product for special steel. Turning to substitution, he said that the cemented hard tools industry (the biggest user of tungsten) relied heavily on overseas supply, by as much as 95 per cent. He noted that the industry in Japan was faced with increased requirements for new material for tools. Such developments had facilitated tungsten-free manufacturing of cutting and drilling tools in two ways. Firstly, the use of various coating materials had extended the lifespan of tools. Secondly, there was greater use of substitutes, in particular cermets, which accounted for a share of nearly 30 per cent of practically all the indexable inserts in 1989 and were expected to exceed tungsten carbide in 1990. With regard to special steel, molybdenum and nickel alloys had become major substitute materials for tungsten steels; their use would be increasingly felt in the future supply and demand situation of tungsten.

39. The Deputy to the Secretary-General of UNCTAD and Director of the Commodities Division said that a number of points raised in national statements were matters that needed serious thought. He referred particularly to the statement made by the representative of Germany, which had noted the decreasing interest of industry in the meetings of the Committee and questioned how the Committee could be made "more efficient and attractive to the relevant companies in the tungsten business". He said that this decrease in interest was happening oddly at a time when the industry would appear to be undergoing a crisis. He also noted that, although most speakers had stressed the importance of transparency in the tungsten market, the data on production and consumption reported by the countries covered only about 25 per cent of

the total. He referred to the changes in the structure of production and consumption towards concentration in a few countries and to special trade arrangements which might have contributed to less interest on the part of industry. He suggested that the Committee should ask itself whether, in this context, proposals such as producer-consumer stabilization agreements, or greatly increased transparency, or international co-operation for research and development on new uses could be pursued further, and how.

40. Several representatives (United States; USSR; European Economic Community; Federal Republic of Germany; Austria, by its industry representative; Japan; France; and Netherlands) responded to the Deputy Secretary-General of UNCTAD and Director of the Commodities Division.

41. The representative of the United States said that the industry was in a crisis situation; ideas were needed on how the Committee could make its work more attractive to industry participants. As far as the United States was concerned, the Committee was not dead. More industry advisers had expressed interest in participating in the current session than the previous one. However, owing to unforeseen circumstances, they had not been able to do so. In his view, the Committee could stimulate discussions on some of the difficulties faced by industry. Part of the problem was that the Committee kept on discussing the same subjects some of which had no chance of consensus and led nowhere, instead of having a programme which would interest industry advisers enough to attend the meeting.

42. The representative of the European Economic Community said that the Committee should look for the reasons for the low participation by industry. These might include the absence of any real exchange of information or the disproportionate length of meetings in relation to what the Committee could offer in return that was unique.

43. The representative of Germany said that his earlier statement did not imply that industry advisers were no longer interested in the tungsten market. He supported the conclusion of the Director of the Commodities Division that industry advisers did not participate in the meeting because they felt unable to influence the development. He pointed out that as long as major suppliers do not make public their figures and intentions, and as long as substantial talks are not possible under these conditions, industry representatives may not participate in these meetings any longer. The Committee should find a way to attract interest. In his view, this meeting should be a forum for consumers and producers, with participation of those

persons affected by the development of the recent tungsten crisis. The presentations of the Soviet guest speakers seemed to be a step in the right direction. He urged avoiding year after year discussion of the proposal of a tungsten agreement with price-stabilizing measures which he described as totally unrealistic and unacceptable.

44. In the view of the industry adviser of Austria, the main reason for the absence of industry advisers was that many of them attended the International Tungsten Industry Association meetings as representatives of their companies. ITIA held annual meetings, provided statistics, organized a seminar every two years and a symposium every three years. In other words, the ITIA competed with the UNCTAD Committee on Tungsten.

45. The representative of France cautioned against exaggerating the crisis in the work of the Committee. She considered the work on statistics to be fundamental and an area in which the Committee needed to make progress. The Committee should focus on subjects of interest to the tungsten industry and she cited new uses of tungsten as one such area, recycling methods being another. In her view, the Committee should avoid always discussing the same subjects.

46. The representative of the Netherlands pointed out that the ITIA Symposium held in Budapest in October 1990 had been attended by industry advisers who were thus not interested in yet another meeting. In his view, the Committee should not try to compete with ITIA but should rather co-ordinate efforts on such subjects as recycling and environmental protection.

47. Following comments by a number of delegates, the representative of the European Economic Commission provided clarification on the agreement recently reached between China and the EEC regarding the import of Chinese tungsten concentrates and some tungsten products into EEC countries. While the agreed price clauses were confidential, he could, however, provide some details concerning the duties and controls involved in the agreement. Regarding the duties, he said that undertakings were offered by the China Chamber of Commerce of Metals, Minerals and Chemicals, acting on behalf of two Chinese exporters, namely the China National Non-Ferrous Metals Import and Export Corporation and China National Metals and Minerals Import and Export Corporation (MINMETAL) to maintain supply in accordance with the rates shown in the table annexed to this report (Annex I). As regards the system of controls, he said that each quarter (after 31 December 1990, 31 March 1991 and

so on), the two parties involved (EEC and China Chamber of Commerce) proceeded to bilateral checking of import volumes and prices with the aim of verifying compliance with the undertakings.

48. At its twenty-second session, the Committee was addressed by two guest speakers, Mr. Marchenko from the Department of Tungsten and Molybdenum Industry of the Soviet Ministry of Metallurgy (USSR) and Mr. Doronjkin from the "Soyuztverdosplav" Production Association (USSR).

49. The first speaker presented background information on the situation and developments in the Soviet tungsten industry during the 1980s. He noted, inter alia, that in his country tungsten was considered to be a strategic raw material. For this reason, he was not in a position to offer statistical data on production and consumption of tungsten. However, he could give figures on percentage changes in Soviet tungsten production, consumption and imports during the past nine years. The salient feature was that consumption of tungsten concentrates during the last decade had decreased by 9.4 per cent while during the same period production had increased by 16.5 per cent. The corresponding figures for changes in consumption and production in the period 1986 to 1989 were minus 7.8 and plus 11.5 per cent, respectively. As a result, the USSR was able to reduce imports of tungsten concentrates by 28 per cent during the past four years, thus reducing considerably the share of imports in total consumption of tungsten. He also informed the Committee about the survey of Soviet tungsten production facilities. Finally, he indicated the interest of the USSR to involve foreign capital in the development of tungsten mining, beneficiation and metallurgical facilities.

50. The second speaker addressed, inter alia, the question of technologies used in the USSR in tungsten concentrate, scrap processing, and manufacture of tungsten products. He also informed the Committee about the end-use applications for tungsten as well as research and development activities, including the development of new alloys in the USSR. He concluded by saying that his Association had significantly broadened its trade and scientific co-operation with the leading world tungsten producers in recent years. There was now an interest in mutually beneficial contracts, covering delivery of various tungsten products.

51. Both presentations were highly appreciated for their informative and technical quality. Comments were made by a number of representatives (United States and International Tungsten Industry Association) and by the UNCTAD secretariat. Clarification was sought on a number of technical points as well as on the developments of the tungsten industry in the USSR.

52. In response to comments on the domestic pricing system, made by the representative of ITIA, and on investment prospects made by the UNCTAD secretariat, the representative of the USSR indicated that foreign capital investments were welcomed in the most efficient projects. He saw possibilities for joint involvement on tungsten, given the relatively low production costs in relation to tungsten prices which were likely to increase eventually if not in the immediate future. He referred to the special policy intended to attract foreign investment. This policy, promulgated by a presidential decree had created a very favourable climate in terms of both profits and taxes; recent legislation was based on encouraging foreign investment.

53. The Committee recommended that the presentations of the two guest speakers be translated and distributed by UNCTAD.